REMARKS

Reconsideration of the pending application is respectfully requested on the basis of the following particulars.

1. Interview of February 15, 2007

The applicant is appreciative of the opportunity to discuss the pending application with the examiner on February 15, 2007. During the interview, proposed amendments to the specification, claims, and drawings were discussed and agreed upon.

It was agreed that the applicant will submit a copy of the previously filed marked up copy of the substitute specification.

In response to the objection to the drawings, it was agreed that the applicant will submit a new drawing Figure 1, which removes the reference numerals 9 and 10, since they are shown in Figure 3. It was also agreed that the applicant will add cross-hatching to Figure 2 in order to show the filling compound. It was further agreed that the applicant will amend the description of drawing Figure 3 in the specification to indicate that the filling compound is not shown, for purposes of clarity.

It was also agreed that the applicant will amend the claims, as shown in the proposed amendment attached to the interview summary in order to overcome the objections and rejections of the claims, and the objections and rejections of the specification.

2. In the specification

A. Specification amendments

The specification is amended, as shown in the foregoing amendment to the specification, to clarify that Figure 3 does not show the filling compound for purposes of clarity. It is respectfully submitted that no new matter is added, since the amendment only clarifies features previously illustrated in the drawing figures as originally filed.

Entry of the AMENDMENT TO THE SPECIFICATION is respectfully requested in the next Office communication.

B. Objection to the specification

Reconsideration and removal of the objections to the specification, as was agreed to in the interview of February 15, 2007, is respectfully requested on the basis that the amended drawings, claims, and specification have overcome the drawing objections.

In particular, a copy of the marked up copy of the specification is provided herewith for completeness.

Further, claim 60 is amended to remove the recitation of the locking element and to recite at least one notch.

Additionally, claims 36, 39, 54, 55, and 56 are amended such that the first, second, and third legs of the insert parts correspond to the first, second, and third legs, as described in the specification.

Accordingly, as agreed during the interview of February 15, 2006, the above drawing, claim, and specification amendments overcome the objections to the specification, and withdrawal of the objections is respectfully requested.

3. In the drawings

A. Drawing amendments

Figure 1 is presently amended in the REPLACEMENT SHEET of page 1 of the drawings. Specifically, reference numerals 9 and 10 are removed for the purposes of clarity. It is respectfully submitted that no new matter is added.

Figure 2 is presently amended in the REPLACEMENT SHEET of page 2 of the drawings. Specifically, reference numeral 9 is removed for the purposes of clarity, and the filling compound is shown with appropriate cross-hatching within the cavity. It is respectfully submitted that no new subject matter is introduced, since

only identification of already illustrated features is provided by way of the amendment.

Acceptance of the REPLACEMENT SHEET is respectfully requested in the next Office communication.

B. Drawing objections

Reconsideration and removal of the drawing objections, as was agreed to during the interview of February 15, 2007, is respectfully requested on the basis that the amended drawings, claims, and specification have overcome the drawing objections.

Specifically, reference numerals 9 and 10 in Fig. 1, which refer to the channels, but apparently reference the filling compound, are removed from Fig. 1 for the purposes of clarity. In order to avoid a further drawing objection, reference numeral 9 is also removed from Fig. 2.

Additionally, cross hatching is added to Fig. 2 in order to show a cross-section II-II of Fig. 1.

Further, the language in claims 54 and 55 requiring the panel to be retained by a plurality of wedges "in combination with a center portion of the second leg" has been deleted, and thus is not required to be shown in the Figures.

Accordingly, as agreed during the interview of February 15, 2006, the above drawing, claim, and specification amendments overcome the drawing objections, and withdrawal of the objections is respectfully requested.

4. In the claims

As shown in the foregoing AMENDMENT TO THE CLAIMS, the claims have been amended to more clearly point out the subject matter for which protection is sought.

A. Claim amendments

Claims 1-35 remain canceled.

Claim 36 is amended to recite the first, second, and third legs to be consistent with the specification. It is respectfully submitted that no new matter is added since the changes merely adjust the nomenclature of existing elements.

Claims 37 and 38 remain canceled.

Claim 39 is amended to recite a first leg consistent with amended claim 36. It is respectfully submitted that no new matter is added since the change merely provides proper antecedent basis.

Claims 40-53 remain canceled.

Claim 54 is amended to recite the first, second, and third legs to be consistent with the specification and to eliminate the recitation of using the wedges "in combination with a center portion of the second leg." It is respectfully submitted that no new matter is added since the changes merely remove elements and adjust the nomenclature of existing elements.

Claim 55 is amended to recite the first, second, and third legs to be consistent with the specification. It is respectfully submitted that no new matter is added since the changes merely adjust the nomenclature of existing elements.

Claim 56 is amended to recite the first, second, and third legs to be consistent with the specification, to provide proper plurals, and to remove the word "resilient." It is respectfully submitted that no new matter is added since the changes merely remove elements and adjust the nomenclature of existing elements.

Claim 57 is amended to be consistent with amended claim 56. It is respectfully submitted that no new matter is added since the change merely provides proper antecedent basis.

Claim 58 remains canceled.

Claim 59 is amended to remove the recitation "means of" and the recitation of the "notches ...the first side." It is respectfully submitted that no new matter is added since the changes merely remove elements for the purpose of clarity.

Claim 60 is amended to remove the recitation of the locking element and to recite the "notch" and further to remove the recitation of "the lip projection being deformable by the at least one locking element" in order to improve clarity. It is respectfully submitted that no new matter is added, since the changes merely remove elements for clarity.

Claims 61-65 are left unchanged.

Entry of the AMENDMENT TO THE CLAIMS is respectfully requested in the next Office communication.

B. Claim objections

Reconsideration and removal of the claim objections, as was agreed to during the interview of February 15, 2007, is respectfully requested on the basis that the amended claims have overcome the claim objections.

Specifically, the word "part" in claim 56 has been changed to be the word "parts," and the phrase "means of" in claim 59 has been deleted, as suggested in Office action.

Accordingly, as agreed during the interview of February 15, 2006, the above claim amendments overcome the claim objections, and withdrawal of the objections is respectfully requested.

C. Rejection of claims 56, 57, 60, and 62-65 under 35 U.S.C. § 112 first paragraph

Reconsideration and withdrawal of this rejection, as was agreed to during the interview of February 15, 2007, is respectfully requested on the basis that the amended claim have overcome the rejection.

With respect to claim 56, from which claims 57 and 62-65 depend, claims 56 and 57 have been amended to remove the word "resilient." Accordingly, with the objectionable word "resilient" removed from the claims, this rejection is rendered moot.

With respect to claim 60, claim 60 has been amended to remove the recitation of the locking element and to recite instead the notch. Accordingly, since the notch is clearly disclosed as reference numeral 15 in the drawing figures and the specification as originally filed, this rejection is rendered moot.

Therefore, as agreed during the interview of February 15, 2006, the above claim amendments overcome the rejection, and withdrawal of the rejection is respectfully requested.

D. Rejection of claims 56 and 60-65 under 35 U.S.C. § 112 second paragraph

Reconsideration and withdrawal of this rejection, as was agreed to during the interview of February 15, 2007, is respectfully requested on the basis that the amended claim have overcome the rejection.

With regards to claim 56, the "resilient member" has been replaced with the word "element" to provide proper antecedent basis.

With regards to claim 59, the phrase "where the free end of the lip projection makes contact with the first side" has been deleted in order to provide clarity.

With regards to claim 60, the "outer surface" has been replaced with the "outer wall" to provide clarity and proper antecedent basis.

Claim 60 has also been amended to remove the recitation of "the lip projection being deformable by the at least one locking element" in order to provide clarity.

Therefore, as agreed during the interview of February 15, 2006, the above claim amendments overcome the rejection, and withdrawal of the rejection is respectfully requested.

5. Allowable subject matter

The applicant gratefully acknowledges the indication of allowable subject matter in claims 36, 39, 54-57, and 59-65. In view of the above amendments, the applicant believes the claims are now in proper form for allowance.

6. Conclusion

As a result of the amendment to the claims, and further in view of the foregoing remarks, it is respectfully submitted that the application is in condition for allowance. Accordingly, it is respectfully requested that every pending claim in the present application be allowed and the application be passed to issue.

If any issues remain that may be resolved by a telephone or facsimile communication with the applicant's attorney, the examiner is invited to contact the undersigned at the numbers shown below.

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Respectfully submitted,

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parts 40: resilient members BROCHEZ

WO 00/19051 PCT/BE99/00123

part 34: inclined part 34

Moulds - Molds = side members

infeed corner piece = corner piece

cavities = attachment channels

infeed parts: insert parts

Corner joint and method for making such a corner joint, as well as infeed corner pieces to realise such a corner joint.

-- BACKGROUND OF THE INVENTION --

The present invention concerns a corner joint, a method for making such a corner joint and an infeed corner piece to realise such a corner joint in view of a significative inertia reduction of the moulds used for making frames.

In particular, it concerns a corner joint for cabinetwork which is made of hollow moulds, whereby this corner joint has at least one infeed corner piece with two infeed parts extending at an angle which extend in the respective far ends of the moulds to be joined.

In the first place, the invention is meant for making a corner joint with metal moulds, but in a more general way it can also be used, at least to a certain extent, for making corner joints with moulds made of other materials, such as PVC and such.

It is known that corner joints in frames, for example of windows and doors, which are made of hollow moulds can be realised by mitre-joining the moulds and by connecting them by means of an infeed corner piece. It is also known that such an infeed corner piece can be locked in different mechanical ways in relation to the moulds such as by means of inwardly bent wall parts meshing in recesses in the infeed corner piece, by means of pins or by means of rotating eccentric pivots, etc.

What is important is that the mitres which are obtained in the end are sufficiently rigid, so that when the glass is

put in, and also as time passes, the frame as a whole will not hang askew and the [moulds] side members will not bend, as a result of which the frame would bulge.

It should be noted that up to now, the locking means are only used as locks with the above-mentioned techniques, without actually contributing to the rigidity and pre-stress of the obtained mitre as a whole. According to the present state of the art, the rigidity is mainly obtained thanks to the rigidity of the material of the corner joining piece in the corner itself. According to a critical, persistent misconception, it is often thought that such rigidity can be obtained by wedging up in a suitable manner, also called fastening by wedges.

The known techniques are disadvantageous in that fatigue [phenomenons] in the corner joining piece soon [become] becomes evident in the frame hanging askew and in that the slightest setting occurring after the wedging up also results in a bending of the [moulds] SM

-- SUMMARY OF THE INVENTION --

The present invention aims an improved corner joint in general, and a corner joint which excludes the above-mentioned disadvantages in particular.

According to special embodiments, it also aims a corner joint which allows for the temporary fluctuation of forces while pressure is being exerted as the whole is pressed together, for the permanent fluctuation of forces as a result of the wedging up of the glass at a later stage, as well as for an optimal expulsion of the hardening locking pastes and/or filling compounds that may be [supplementary] used.

Also, in the first place, the invention concerns a corner joint of the type mentioned in the introduction, characterised in that it is provided with supplementary features which increase the resistance of this corner joint and of the mitre as a whole in particular against deformation, in particular the hanging askew of the frame as a whole and/or the bulging of the respective moulds.

As the corner joint is equipped with supplementary features which increase the resistance against any possible hanging askew, the rigidity of the corner no longer solely depends on the rigidity of the infeed corner piece at the height of the corner itself and of the wedging up, which has for a result that the corner joint is less subject to the above-mentioned disadvantages and that the quality of the corner joint increases.

The above-mentioned supplementary features can be of different nature according to the invention. On the one hand, these features may consist of means provided on the infeed corner piece and/or the moulds, which reinforce the corner as a whole. On the other hand, these features may also consist of means provided on the infeed corner piece and/or the moulds, which exclude disadvantageous situations, such as for example disadvantageous effects in case of frost. Further, these features may also consist of a suitable adjustment and/or positioning and/or combination of the different components, such as a result of a number of measures taken according to the invention while the corner joint is manufactured.

The different supplementary features which can be provided to the infeed corner piece itself can be either or not combined in a symbiotic manner.

According to a major preferred combination, the corner joint is characterised in that it is provided with an infeed corner piece with infeed parts which represents at least the following combination of characteristics:

- that the infeed corner piece has a part on at least one of the infeed parts and preferably on both infeed parts which extends through the cavity of the accompanying mould in an oblique manner as of the accompanying locking means up to the opposite wall of the cavity in which the infeed corner piece is situated, whereby this part forms a support up to a place which is situated significantly deeper in the cavity than the above-mentioned locking means;
- that the infeed parts are equipped with parts which are joined together at an angle and which are each connected at their far ends with the above-mentioned accompanying oblique part, such that pressure created in the oblique parts creates a tensile force in the first-mentioned parts;
- that the above-mentioned parts which are joined together at an angle are situated against the inner wall of the cavities in which the infeed parts are provided; and
- that the infeed parts mainly have the shape of an arrow point split in the longitudinal direction, whereby the outer corner is mainly free of any material, possibly to the exception of a number of elastically deformable positioning parts.

For the different embodiments of the invention, we refer to the description in the claims, as well as to the following detailed description.

The invention also concerns a method for realising the above-mentioned corner joint, whose characteristics will also become clear from the following detailed description.

-- BRIEF DESCRIPTION OF THE DRAWINGS --

In order to better explain the characteristics of the invention, the following preferred embodiments of the invention are described as an example only without being limitative in any way, with reference to the accompanying drawings, in which:

figure 1 represents a section of a corner joint according to the invention;
figure 2 represents a section to a larger scale according to line II-II in figure 1;
figure 3 represents the central part from figure 1 to a larger scale;
figures 4 and 5 represent a view to a larger scale of the parts indicated by F4 and F5 in figure 1;
figure 6 represents the [infeed] corner piece from figure 1 in perspective;
figure 7 represents the corner joint from figure 1 while being manufactured in the moulding machine;
figures 8 and 9 represent variants, whereby a similar corner piece is used in two different applications;
figure 10 represents the [infeed] corner piece from figures 8 and 9 as dismounted;
figure 11 shows a view according to arrow F11 in figure 10, whereby the parts of the [infeed] corner piece are connected to one another.

-- DETAILED DESCRIPTION OF THE INVENTION --

As represented in figures 1 to 7, the invention concerns a corner joint 1 for connecting hollow [moulds] SM 2-3 at a right angle or any other angle whatsoever, whereby the connection is realised by means of a [infeed] corner piece 4 which is represented more specifically in figure 6 and which has two

infeed parts 5-6 extending at an angle which are pushed in the respective far ends 7-8 of the moulds 2-3 to be connected, in particular in the cavities 9-10 provided therein.

These moulds 2 and 3 are hereby mitre-sewn in the known manner, and the aim is that, when they are mounted as represented in figure 1, they always fit up perfectly on the mitre joint, and under pre-stress according to the invention.

The mutual interlocking between the infeed corner piece 4 on the one hand and the moulds 2-3 on the other hand is carried out by means of locking means 12 which, in the example from figures 1 to 7, are each time formed of a lip 13 which consists of a pressed-in material part of the outer wall 14 which confines the cavity 9, 10 respectively and which is situated in a notch 15. It should be noted that, as will be described further as well, these locking means 12 do not necessarily have to consist of a pressed-in material part, but that they may also be formed in another manner, for example by means of a drive-in pen, a rotating eccentric pin, etc.

In the given example, the corner joint is part of a window in which is provided a pane of glass 16 which is fixed in the window by means of wedges 17. Under the wedges 17 can be provided, as represented in figure 1, a protective layer and/or insulation layer 18.

The invention is special in that the corner joint 1 is equipped with a number of supplementary features, as a result of which this corner joint 1 has been optimised in many respects in a symbiotic context; in particular it is

more resistant against deformation, not only during the wedging up of the pane of glass 16, but also afterwards.

As will become clear from the following description, different supplementary features are combined in the example represented in figures 1 to 7. It should be noted that, although such a combination is preferable, the invention also concerns embodiments in which only one or several of these features are applied.

A first feature consists in that a tensioning force is created at the height of the locking means 12 which not only provides for a locking effect, but which also creates an effective tensile force in the corner, i.e. pressure on both SM moulds and tension in the infeed corner piece. Thus, the invention provides for mechanical locking means generating pre-stress.

In the case where these locking means 12 consist of upset material parts, as the represented obliquely pressed-in lips 13, this is preferably realised by upsetting the material part, in this case by compressing the material of the lip 13 from a length A to a shorter length B, as indicated in figure 4, having one or several of the following characteristics:

- An upsetting which is close to the maximally admitted upsetting of the material, so as to allow for a safety margin. In order to do so, one only has to adjust the angle of inclination between the sides of the notch 15 indicated by A and B to the deformability limit of the material to be processed.
- An upsetting which is nominally sufficiently large so as to set off the usual production tolerances and lacquer thicknesses on the extruded semi-finished

products [infeed] corner pieces and [moulds]. In order to do so, one only has to increase the upsetting, namely the difference between A and B, in case of larger production tolerances / lacquer thicknesses, reduce them respectively in case of smaller production tolerances.

- An upsetting whose useful working force on the total mitre can only be increased (optimised) by enlarging the head of the pressed-in lip. In order to be able to do so, one only has to increase the extrusion thickness of the wall from which the lip originates and/or widen the meshing knives of the moulding machine in which the lip is generated.

A second [supplementary] feature consists in that, in order to be able to press the above-mentioned lips 13 in, use is made of a notch 15 which has one or several and preferably all of the following characteristics:

- A notch 15 which is characterised in that it is triangular. Thus can be obtained among others that the side 19 of this triangular notch 15 is situated in the direction of or mainly in the direction of the pressed-in lip 13, whereby the creation of any free spaces between the lip 13 and the side 19 is restricted, as opposed to the known trapezoidal recesses, whereby a relatively large free space remains under the pressed-in lip. [De] disadvantages of such a large space, such as the fact that water can gather in it which may push the lip outward in case of frost, the fact that there can be no effective pressing and the fact that the lip can easily buckle, are minimised thanks to the use of the triangular notch 15, or even excluded. Moreover, a trapezoidal notch (with a bottom parallel to the wall to be

perforated) is also disadvantageous in that the top of the pressed-in lip has to endure all possible insertion forces and is deformed into a point when the utmost material limit is exceeded. Thus, the lip entirely loses the stress transmission on the infeed corner piece.

- A notch 15 which is a right-angle triangle, whereby the relation between the side 19 against which the lip is situated and the side 20 over which the free end 22 of the lip 13 is pressed in, just as the relation A/B and just as the acute angle between A and B, is dictated by the compression characteristics of the processed material of the mould cylinder.

- A notch 15 which is triangular, whereby the side 19 against which the lip 13 is situated is longer than the side 20 over which the free end 20 of the lip 13 is pressed in.

- A notch 15 whereby the above-mentioned side 20, as represented in figure 4, has a concave bent and/or buckled shape. This allows for differences resulting from production tolerances and lacquer thicknesses to be compensated for and moreover to realise an efficient press-on. Also, the part 22 which is situated deepest preferably extends in a direction which is rectangular or almost rectangular to the longitudinal direction of the folded lip 13, such that the lip 13 will almost certainly remain in place.

- A notch 15 having a depth D in the order of magnitude of 3 to 4 mm.

A third supplementary feature includes consists in that, in the case of embodiments which are equipped with obliquely pressed-in lips 13, as represented in figures 1 to 7, use is made of stop parts 23 which are situated behind the lips 13 and which allow for an efficient pressing-on with a relatively

large force. In this manner it is possible to effectively create tensile forces in the corner joint, as opposed to the known embodiments, where the pressing-in of the lips is confined by stops which only allow for a restricted press-on force.

Moreover, the corner joint 1, in particular the stop parts 23, preferably represent one or several of the following characteristics:

- The stop parts 23 extend in the prolongation 24 of the press-on direction F, such that the press-on forces are optimally absorbed.
- Over the major part of their girth, the stop parts 23 are detached from the remaining structure of the [infeed] corner piece 4, such that any possible deformations in the stop part 23[, which are either or not temporary,] cannot have a negative influence on the aimed maximal force transmissions via the remaining structure of the [infeed] corner piece 4.
- The stop parts 23 are only connected to the rest of the [infeed] corner piece 4 at their base 25, such that they are almost entirely detached from the surrounding structure.
- The [infeed] corner piece 4 has a framed structure, in other words it does not necessarily have a full structure, but it is built up of legs 26-27-28-29, whereby the stop parts 23 are made thicker than the surrounding parts, in particular the leg 29 of the framed structure, and/or are made equally thick as the total length of the pressed-in lip.
- Near every stop part 23 concerned, the [infeed] mount parts 5-6 of the [infeed] corner piece 4 are equipped with a recess 30 [meant] arranged for storing any possible material which has been scraped off during the pressing in of

the lips 13. Thus is assured that no unwanted material can end up between the stop surfaces 31, which form the side 19 of the above-mentioned triangle, and the lips 13. As is represented in the figures, this recess 30 consists of a groove which also makes sure that the stop parts 23 are detached from the rest of the structure over practically their entire girth.

- Every stop part 23 concerned is carried out in relief, preferably in the shape of a serration 32. The stop surface 31 which is carried out in relief offers the advantage that a better bond is obtained for locking pastes and that the material on the stop surface 31 can be somewhat flattened, so that [a too] large pressure movement or angular divergence during the pressing can be compensated for without damaging the corner joint 1.

- The stop parts 23 have such a shape that the formation of [cavities], to the exception of any possible small [cavities] formed by the serration 32, under the pressed-in lips 13 is restricted and preferably excluded for the above-mentioned reasons.

- Every stop part 23 concerned has a stop surface 31 which is inclined, equivalent to the inclination of the pressed-in lip 13.

- The basis 25 of every stop part 23 concerned is directly supported by the inner wall 33 confining the above-mentioned [cavity] 9, 10 respectively.

A fourth [supplementary] feature [consists in] that the [infeed] corner piece 4 is equipped with a part 34 defining a pressure zone between the locking means 12 on the one hand, i.e. the lips 13 in the example represented in figure 1, and a place P on the wall 33 which is situated deeper in the [cavity] 9, 10 respectively on the other hand, such that there can be a pressure increase between the above-

mentioned place P and the place Q of the locking means 12. As a result of this pressure increase, there will also be a pressure force in the parts 35 and 36 of the outer walls 14 between the locking means 12 and the corner point, so that these parts are pressed against one another with a force F1.

The parts 34 are in this case a fragment of the above-mentioned legs 26. By making use of legs, i.e. material parts which are detached from the environment, apart from a number of local connections, for example at their far ends, the transition of the pressure force is not influenced by the environment.

When the corner joint 1 as represented in figure 1 is part of a frame, of a window or a door, in which a panel, in particular a pane of glass 16, is provided by wedging it up by means of wedges 17, the latter will be situated in the prolongation of the above-mentioned part 34 according to the invention, preferably with their centre. In particular, the intersection 37 between the edge of the pane of glass 16 and the theoretical line 38 will be situated in the middle of the wedges 17.

Glass and window manufacturers recommend to wedge the glass up on the corners at 1/10 of the height or width of the pane of glass 16 respectively. In practice, however, the wedges 17 are usually situated with their centre at about 10 cm of the inner corner. According to a practical embodiment, the above-mentioned part 34 will then preferably also be directed such that when it is used, the above-mentioned intersection 37 will be situated more or less at a distance Z from the corner of the pane of glass 16 which is in the order of magnitude of 10 cm.

According to the practical embodiment of the invention, the lips 13 are pressed-in in such an oblique manner that at least one of the following characteristics is met:

- Every lip 13 concerned is pressed-in such that the free end 21 is situated behind the central axis 39 of the ~~above-mentioned~~ part 34, and better still such that the above-mentioned line 38 is situated on the inside of the central axis 39. As most of the material of the part 34 is thus situated on the outside of the line 38, the part 34 will bulge outward under a pressure load, and the side against which the lip 13 is pressed will obtain an inward inclination which partly prevents the lip 13 from protruding outward.
- Every lip 13 concerned has a direction which is bent slightly inward in relation to the direction of the ~~above-mentioned~~ part 34, in particular in relation to the pressure line, as a result of which the lip 13 is also prevented from protruding outward in case of a pressure increase.

In the given example, the above-mentioned part 34 is made in the shape of a leg 26 which is part of a triangle whose second leg 27 extends against the inner wall 33 and whose third leg 29 forms a link between the first-mentioned leg 26 and the second leg 27, as a result of which the position of the leg 26 is always stable.

A fifth supplementary feature consists in that the infeed parts 5-6 are equipped with parts 40 which are connected to one another at an angle and in that the corner joint 1 has means which make it possible to create a tensile force in these parts 40. In the given example of figures 1 to 6, these parts consist of legs 27-28 situated in the extension

RM = resilient members

of one another. These parts 40 integrally provide for the reactive tensile force to the compression force which occurs in both mould ends, found both on the inner mitre side and on the outer mitre side of the mould cylinders and which have been created by pushing off both moulds on the notch of the infeed corner. Under a mitre load resulting from the wedging up of the glass, these tension members 40 of the infeed corner which have been moved as close as possible to the inner mitre side prevent the inner mitre joint from ripping open, partly helped by the thus created increase of pressure forces on the mould cylinders on the outside of the mitre.

The tensile forces F2 indicated in the parts 40 in figure 1 thus result in pressure forces F1 both in the outer walls 33 as in the inner walls 14.

In the example, the means for creating a tensile force consist of the above-mentioned slanting parts 34 which are respectively linked to the accompanying free end of the part 40. The above-mentioned pressure in the parts 34 thus results in a tension in the parts 40. resilient members

Preferably, the above-mentioned parts 40 are situated against the inner wall 33 of the respective cavities 9-10, such that the tensile force is optimally transmitted to the inside corner.

A sixth supplementary feature consists in that the corner joint 1 is mainly free of parallel surfaces between the infeed corner piece 4 and the outer walls 14 which confine the cavities 9-10, to the exception of possible zones in which locking means are mounted. As is shown in figures 1 and 2, this implies that there are no essential contact surfaces between the outer walls 14 and the infeed corner

piece 4 which might freeze open. It should be noted, however, that in the case where for example drive-in pens 41 are used, as represented in figures 8 and 9, there may be a restricted parallel contact over a distance D1 formed by the zone which is required for mounting this sort of locking means.

A seventh [supplementary] feature [consists in] that a free space 42 is provided at least on the outside corner of the [infeed] corner piece 4, in particular a space 42 which is free of massive material, such that any compression or ripping open of the material of the tension zones which is thus weakened and thinner in the connecting corner could occur during the pressing in the moulding machine so as to compensate for possible extrusion tolerances on the rectangular shape of both [parts] 40.

An eighth [supplementary] feature [consists in] that the [infeed] corner piece 4 is provided with positioning elements to force said [infeed] corner piece 4 in the right position as they are provided in the [cavities] 9-10. In the given example, these positioning elements consist of elastically bendable flaps 43 on the one hand which are provided on the [infeed] parts 5-6 at a distance from the angular point and which co-operate with the outer wall 14, and of supporting and guiding elements on the angular point itself on the other hand, preferably in the shape of a little leg 44 provided with elastically bendable flaps 45 which co-operate with the outer wall 14 respectively, as represented.

It should be noted that such positioning elements according to the invention can also be made in other manners. Thus, they may for example consist of several elastic press-on means which push the [infeed] parts 5-6 with their inside

towards the inner wall 33. These press-on means may be part of the [infeed] corner piece 4 as well as of the wall 14, or they may also consist of loose elements which are provided between the [infeed] corner piece 4 and the wall 14. Instead of elastically bendable flaps 43, also spiral springs can be used, elastically compressible masses such as rubber, etc.

Another [supplementary] feature consists of a space 46 provided in the material of the [infeed] corner piece 4, right behind the inside corner, without the material of the inside corner having been removed, however, which space makes it possible to push away any burrs which may be present on the [moulds] 2 or 3.

As is represented in detail in figure 5, this space 46 can be made such that there remains a hock-shaped material part 47 which can be easily bent. As material remains present in the corner itself, a correct positioning up into the corner is initially possible.

It should be noted that, in former days, the inside corner was always provided with a groove in the extension of the mitre joint, which is disadvantageous in that the sharp inside mitre side of the first [mould] in which the [infeed] corner piece 4 was provided, always [ended up too deep in] this groove. Thanks to the embodiment as described above, this disadvantage is excluded[. For,] the hock-shaped material part 47 offers enough resistance for a correct manual joining of the [moulds] 2 and 3, but it gives in under the large pressure as the whole is pressed and it bends away if there are any sawing burrs.

Further, a number of measures are preferably taken according to the invention while the corner joint is being

manufactured, which contribute to the correct formation of the corner and thus also to its rigidity. This will be explained hereafter, with reference to the accompanying figure 7 in which the pressing knives 48 for forming and pressing in the lips 13 are represented, as well as a counter block 49.

Since the introduction of the thermal interruption, there has been an additional problem related to the total [mould] section retaining its shape. Under the influence of the different forces which are exerted on the [moulds] 2-3, the thermal interruption, which usually has a rectangular shape when seen as a cross section, may start to deform, for example into a shape having the section of a parallelogram.

That is why the [moulds] 2-3 according to the invention will preferably be forced first to assume their correct section at the height of their future saw cut. This 'forcing' takes place by providing for example supporting blocks around, or at least partially around the [moulds] 2-3, which blocks have a seating for the [moulds] 2-3 which follow the theoretically perfect design of the [moulds] 2-3. Also, the press-on elements, in particular press-on pistons, of the clamping device with which the [moulds] 2-3 are held in the sawing machine can possibly be provided with a seating which coincides with the pattern of the [moulds] 2-3.

Also during the actual pressing, as represented in figure 7, a number of special measures are preferably taken according to the invention.

First, a positioning is provided for by means of an adjusting fork 50. This adjusting fork 50 can be moved in a direction V in relation to the pressing knives 48, such that the corner formed by the [moulds] 2 and 3 can be

situated more or less deep between the pressing knives 48. The adjusting fork 50 is hereby set such that the short sides 20 of the notches 15 end up in the extension of the pressing knives 48. Depending on the thickness of the wall of the [moulds] SM 2-3 and the counterpressure of the counter block 49, the initially set distance will have to be lengthened or shortened somewhat by feel.

Usually, a few simple tests on dry-made test mitres, by which we mean that no locking pastes or such are used, will do in order to be able to process a specific series of [moulds] SM over a longer period. A good valuation can be made on the basis of the following two tests:

- By trying to push open the corner formed by the [moulds] SM 2-3. If the mitre joint 11 stays together, the corner joint is okay.
- By checking the short side 20. When it is somewhat scraped off after the pressing, this indicates that the corner joint 1 is sufficiently rigid.

For the counterblock 49 is preferably also used a AS block with a seating whose shape is adjusted to the shape of the [mould] SM such that the [moulds] SM 2-3 are also forced to keep assuming their correct form during the pressing.

As far as the section and corner of the pressing knives 48 are concerned, it should be noted that wider lips 13 are to be preferred over narrow lips 13, whereas the angle of inclination is preferably selected on the basis of the elastic qualities of the material of the [mould] [cylinder] SM 2 attachment channel [walls to be processed]

The stroke back and forth of the pressing knives 48 is preferably adjusted such that the end point of the movement

is situated such that, during the pressing, the mitre as a whole rebounds slightly on the counterblock 49. Then one can be sure that the bottom of the lips 13 is pressed perfectly against the stop surface 31 concerned.

Depending on the destination of the windows, the corner joints 1 will be protected in one or several places by means of a protective compound, paste, or such.

This protective compound may consist of a filler, for example polyurethane or glue, whereby this glue is essential, not as far as rigidity is concerned, but as far as sealing and bearing is concerned.

According to a first possibility, a filling compound may be provided beforehand in the above-mentioned notches 15 before shifting the [insert] infeed corner piece 4 in the [attachment channels] cavities 9-10. Depending on the amount used, this filling compound offers one or several advantages. In the case of a small amount, possible cavities under lips 13 will be filled, so that no water can gather underneath it which might push the lips 13 outward in case of frost. If a somewhat larger amount is used, at least a part of the filler is driven out from under the lips 13 during the pressing and forced towards the sides thereof, so that the passages around the lips 13 are closed off, such that no water can penetrate in the [moulds] 2-3 side members.

In case an even higher degree of protection is required, a filling compound will be preferably provided on top of the pressed-in lips 13 which is skimmed off evenly with the outer side of the [moulds] side members. In this manner, the notches 15 are entirely filled, so that also the unprotected aluminium around the lips 13 is protected against oxidation. This filling up is particularly appropriate for windows which

are placed in relatively aggressive environments, such as coastal areas and industrial areas.

According to yet another possibility, a filler can also be provided in the [cavities] attachment channels 9-10, prior to the placing of the [infeed] insert corner piece 4. Thanks to the smooth, arrow-shaped design of the [infeed] insert parts 5 and 6, said filler will be optimally driven out to the most appropriate location, as indicated by reference 51 in figure 1. This technique makes it possible to partly relieve the lips 12, as the pressure transfer surface is enlarged. This is particularly appropriate for larger windows and heavy panes of glass.

Further, it is possible to apply a protective means with a very fine molecular structure on the mitre joint 11 itself for joining together the [moulds] side members 2 and 3, such that the mitre joint, in case the reveal surfaces of both [moulds] side members are not situated in a plane due to extrusion tolerances, are protected against oxidation.

The [moulds] side members 2-3 are themselves provided with a protective layer, such as lacquer or a layer of synthetic material, but it is clear that there is no such layer on the saw cut itself.

It is clear that this saw cut/oxidation coating may not contain any solvents which might affect the lacquer. Moreover, this oxidation coating has a structure which is fine enough in order to avoid that the product is driven entirely out of the mitre joint 11 under the pressure of both mould cylinders.

It should be noted that the invention is not restricted to infeed corner pieces 4 with [infeed] insert parts 5-6 which are

fixed to one another, but that, according to a variant, these [insert] infeed parts may also be adjusted at an angle. An example thereof is represented in figures 8 to 10.

The [insert] infeed parts 5 and 6 are hereby hinge-mounted to one another by means of a pivot 52. To this end, the far ends of these [insert] infeed parts 5 and 6 which are directed to one another are each provided with a hook-shaped part 53-54, with seatings 55-56 in which the pivot 52 is provided in a loose manner.

The one hook-shaped part 54 is made in the shape of a fork, as can be seen in figure 11, in between which the other hook-shaped part 53 is placed.

It should be noted that the infeed corner pieces 4, both in the embodiment of figures 1 to 7 and in the embodiment of figures 8 to 10 preferably consist of extruded pieces, in particular pieces which are made by cutting off parts of an extruded [frame member] mould and which are finished if necessary.

The infeed corner piece 4 of figures 8 to 10 also differs from the one in figure 1 in that, instead of inwardly bent lips 13, use is made of conical drive-in pens 41 which are driven in. It is clear, however, that practically all other characteristics of the embodiment of figures 1 to 7 also apply in this case.

Thus, for example, in the case of conical drive-in pens, the recess 30 which loosens the material can be replaced by placing the openings as little central as possible, i.e. the openings in which the drive-in pens are provided in the direction of the top of the mitre as a whole, so that even here no material can be found anymore which could hinder

the pressing-on of the top of the arrow point to the inside of the mitre.

It is clear that also other locking means than the lips 13 or the drive-in pens 41 can be applied while still remaining within the scope of the invention.

It should be noted that when several [infeed] corner pieces are used which are to be pressed simultaneously (for example thermally interrupted [single numbers moulds] having several chambers in which such [infeed] corner pieces can be placed), it is utterly important that at least the design of the notches themselves is identical for the simultaneously carried out pressing to have the same optimal effect on the different [infeed] corner pieces.

The present invention is by no means limited to the above-described embodiments represented in the accompanying drawings; on the contrary, such a corner joint, the [infeed] corner piece used therefor and the above-mentioned method can be made in all sorts of variants while still remaining within the scope of the invention.